IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND the claims in accordance with the following:

30. (CURRENTLY AMENDED) A parallel efficiency calculation apparatus for calculating a parallel efficiency of a parallel computer system executing a specific processing as a whole, comprising:

a storage device;

a first calculator calculating and storing into said storage device, a load balance contribution ratio Rb(p) according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using a processing time $\gamma_i(p)$ of a parallel processing portion within a processing executed in each said processor i, a processing time $\chi_{i,j}(p)$ of each parallel performance impediment factor j within said processing executed in each said processor i and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$, and

$$\tau(p) \equiv \underset{i=1}{\overset{p}{Max}}(\tau_i(p))$$;

a second calculator calculating and storing into said storage device, a virtual parallelization ratio $R_p(p)$ according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using said processing time $\gamma_i(p)$, said number p of processors of said parallel computer system and $\tau(1)$, which is substantially equivalent to a processing time in case where only one processor executes said specific processing;

a third calculator calculating <u>and storing into said storage device,</u> a parallel performance impediment factor contribution ratio Rj(p) according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using said processing time $\chi_{i,j}(p)$ and said number p of processors of said parallel computer system; and

a fourth calculator calculating <u>and storing into said storage device,</u> a parallel efficiency <u>Ep(p)</u>

$$\underline{E_p(p) = R_b(p) \cdot \frac{1}{R_p(p)} \cdot \left(1 - \sum_{j=1}^{j_{Others}} R_j(p)\right)}$$

by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio; and

a display device displaying the calculated parallel efficiency <u>that is stored in said storage device</u>.

35. (CURRENTLY AMENDED) A ~~computerized~~ parallel efficiency calculation method for calculating a parallel efficiency of a parallel computer system executing a specific processing as a whole, said ~~computerized~~ parallel efficiency calculation method comprising:

<u>providing a system separate from said parallel computer system comprising a first calculator, a second calculator, a third calculator, a fourth calculator, and a storage device;</u>

<u>providing a measuring unit in said parallel computer system;</u>

measuring, in each processor i of said parallel computer system, a processing time $\gamma_i(p)$ of a parallel processing portion within a processing executed in each said processor, and a processing time $\chi_{i,j}(p)$ of each parallel performance impediment factor j within said processing executed in each said processor, <u>wherein said measuring is executed by said measuring unit in said parallel computer system;</u>

calculating <u>and storing into said storage device, by said first calculator,</u> a load balance contribution ratio Rb(p) according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$, and

$$\tau(p) \equiv \underset{i=1}{\overset{p}{Max}}(\tau_i(p))$$;

calculating <u>and storing into said storage device, by said second calculator,</u> a virtual parallelization ratio $R_p(p)$ according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using the measured processing time $\gamma_i(p)$, said number p of processors of said parallel computer system and $\tau(1)$, which is substantially equivalent to a processing time in case where only one processor executes said specific processing;

calculating <u>and storing into said storage device, by said third calculator,</u> a parallel performance impediment factor contribution ratio Rj(p) according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using said processing time $\chi_{i,j}(p)$ and said number p of processors of said parallel computer system; and

calculating <u>and storing into said storage device, by said fourth calculator,</u> a parallel efficiency <u>Ep(p)</u>

$$E_p(p) = R_b(p) \cdot \frac{1}{R_p(p)} \cdot \left(1 - \sum_{j=1}^{j_{Others}} R_j(p)\right)$$

by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio; and

outputting the calculated parallel efficiency that is stored in said storage device to a display device.

36. (CURRENTLY AMENDED) A computer readable storage medium embodying a program for causing a computer to execute operations calculating a parallel efficiency of a parallel computer system executing a specific processing as a whole, said operations comprising:

a storage device;

calculating and storing into said storage device, a load balance contribution ratio Rb(p) according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using a processing time $\gamma_i(p)$ of a parallel processing portion within a processing executed in each said processor i, a processing time $\chi_{i,j}(p)$ of each parallel performance impediment factor j within said processing executed in each said processor i and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$, and

$$\tau(p) \equiv \operatorname*{Max}_{i=1}^{p}(\tau_i(p))$$;

calculating and storing into said storage device, a virtual parallelization ratio $R_p(p)$ according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using said processing time $\gamma_i(p)$, said number p of processors of said parallel computer system and $\tau(1)$, which is substantially equivalent to a processing time in case where only one processor executes said specific processing;

calculating <u>and storing into said storage device,</u> a parallel performance impediment factor contribution ratio Rj(p) according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using said processing time $\chi_{i,j}(p)$ and said number p of processors of said parallel computer system; and

calculating <u>and storing into said storage device,</u> a parallel efficiency <u>Ep(p)</u>

$$\underline{E_p(p) = R_b(p) \cdot \frac{1}{R_p(p)} \cdot \left(1 - \sum_{j=1}^{j_{Others}} R_j(p)\right)}$$

by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio; and

outputting the calculated parallel efficiency <u>that is stored in said storage device</u> to a display device.